



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------------|------------------|
| 10/726,745 | 12/02/2003 | Gopichandra Surnilla | 202-1387 (81091436) | 6819 |
| 36865 | 7590 | 12/13/2006 | (FGT) | |
| ALLEMAN HALL MCCOY RUSSELL & TUTTLE, LLP 806 S.W. BROADWAY, SUITE 600 PORTLAND, OR 97205 | | | EXAMINER NGUYEN, TU MINH | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3748 | |

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,745

Applicant(s)

SURNILLA ET AL.

Examiner

Tu M. Nguyen

Art Unit

3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6, 8, 9, 12-15, 17, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Boegner et al. (U.S. Patent 6,637,189).

Re claims 1, 13, and 20, Boegner et al. disclose a method, a system, and a computer storage medium having instructions encoded therein for controlling an engine, the system comprising:

- a first emission control device (SOx trap (line 22 of column 1)) coupled to the engine;
- a second emission control device (NOx adsorber) coupled to the engine, the second device susceptible to sulfur contamination and located downstream of the first device; and
- a controller (not shown but inherently must have) for deciding whether to reduce sulfur contamination in the second device based on at least an operating condition (lines 48-51 of column 3); in response to a decision to reduce sulfur contamination: raising temperature of the device by adjusting engine operation (Phase I) (line 57 of column 3 to line 24 of column 4); and

Art Unit: 3748

when the temperature reaches a preselected value, oscillating an air-fuel ratio entering the second device between rich and lean to reduce the sulfur contamination (Phase III) (see line 55 of column 4 to line 15 of column 5), where a peak amplitude of the air-fuel oscillations is determined based on an exhaust temperature (see lines 14-27 of column 6, claim 2, and especially lines 25-29 of column 4 where Boegner et al. disclose that a desulfurization temperature range must be maintained during Phase III).

Re claim 2, in the method of Boegner et al., the peak allowable amplitude decreases as temperature increases, where the air-fuel ratio oscillations are maintained below the peak value to prevent operation that could increase platinum particle size (see lines 3-6 and lines 42-65 of column 5).

Re claims 3 and 14, in method and system of Boegner et al., the controller increases a period of oscillations as an amplitude of oscillations is decreased (lines 3-6 of column 5).

Re claims 4 and 15, in method and system of Boegner et al., the lean and rich oscillation is asymmetric (see line 65 of column 4 to line 6 of column 5).

Re claims 6 and 17, in the method and system of Boegner et al., the lean and rich oscillation is controlled to be symmetric, as clearly shown in Figure 1A during Phase III.

Re claims 8-9, the method of Boegner et al. further comprises adjusting a period of oscillations based on operating conditions, wherein the operating conditions include at least one of temperature of the device and exhaust gas temperature.

Re claim 12, in the method of Boegner et al., the raising temperature of the device by adjusting engine operation includes retarding ignition timing (lines 8-15 of column 2).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. as applied to claims 4 and 15, respectively, above, in view of legal precedent.

The method and system of Boegner et al. disclose the invention as cited above, however, fail to disclose that a time integral of the lean oscillation is controlled to be equal to a time integral of the rich oscillation.

Boegner et al. disclose the claimed invention except for specifying that a time integral of the lean oscillation is equal to a time integral of the rich oscillation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a specific optimum value of hole diameter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). This is especially true when Boegner et al. disclose that a frequency and interval of a rich or lean modulation are set variably to maintain the NO_x adsorber temperature within a predetermined desulfurization range.

5. Claims 7, 10 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. as applied to claims 1 and 15, respectively, above, in view of Hepburn et al. (U.S. Patent 6,199,373).

Art Unit: 3748

Re claims 7 and 18, the method and system of Boegner et al. disclose the invention as cited above, however, fail to disclose that the controller adjusts an amplitude of the air-fuel oscillations based on an oxygen storage amount of an upstream emission control device.

As shown in Figure 1, Hepburn et al. disclose an apparatus for desulfating a NOx trap (32) having an upstream TWC (26). The TWC is located closer to the engine, where it is effective to purify harmful emissions during an engine start-up. As depicted in Figure 3 and indicated on line 55 of column 3 to line 12 of column 4, when the NOx trap is to be desulfated, Hepburn et al. teach that it is conventional in the art to adjust an amplitude of an air-fuel oscillations based on an oxygen storage amount of the TWC so that a lean or rich breakthrough across the TWC can be achieved for desulfating the NOx trap. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the TWC and the teaching taught by Hepburn et al. in the method and system of Boegner et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively remove SOx from the NOx adsorber.

Re claim 10, in the modified method of Boegner et al., the raising temperature of the device by adjusting engine operation includes exhaust air-fuel ratio between lean and rich to generate heat in an upstream device ((26) in Hepburn et al.) having oxygen storage capacity.

Re claim 19, in the modified system of Boegner et al., the controller further adjusts a period of oscillations based on operating conditions (exhaust temperature).

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boegner et al. as applied to claim 1 above, in view of Takahashi et al. (U.S. Patent 6,237,330).

Art Unit: 3748

The method of Boegner et al. discloses the invention as cited above, however, fails to disclose that the raising temperature of the device by adjusting engine operation includes operating a first group of cylinder lean and a second group of cylinders rich, with the rich and lean exhaust gas mixing to generate exothermic heat.

As shown in Figure 1, Takahashi et al. disclose an exhaust purification device for an internal combustion engine, comprising a rear catalyst (23) susceptible to sulfur contamination. As indicated in the Abstract, when the rear catalyst is to be desulfated, Takahashi et al. teach that it is conventional in the art to raise temperature of the rear catalyst by adjusting engine operation including operating a first group of cylinder lean and a second group of cylinders rich, with the rich and lean exhaust gas mixing to generate exothermic heat at the catalyst. It would have been obvious to one having ordinary skill in the art at the time of the invention was made, to have utilized the teaching by Takahashi et al. in the method of Boegner et al., since the use thereof would have been routinely practiced by those with ordinary skill in the art to effectively remove SO_x from the NO_x adsorber.

Prior Art

7. The IDS (PTO-1449) filed on December 2, 2003 has not been considered because PTO record for this IDS does not include a listing of the references. Applicant is requested to include a substitute IDS in response to this Office Action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents: Boegner et al. (U.S. Patent 6,119,450), Tanaka et al.

Art Unit: 3748

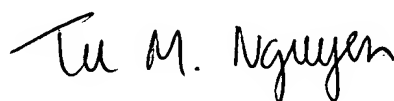
(U.S. Patent 6,336,320), Hertzberg et al. (U.S. Patent 6,843,052), and Pott et al. (U.S. Patent 6,941,748) further disclose a state of the art.

Communication

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Tu Nguyen whose telephone number is (571) 272-4862.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas E. Denion, can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TMN

Tu M. Nguyen

December 9, 2006

Primary Examiner

Art Unit 3748